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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,517	08/13/2001	Hideo Takizawa	212671US2	7240

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EXAMINER

DAY, HERNG DER

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,517

Applicant(s)

TAKIZAWA, HIDEO

Examiner

Herng-der Day

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-15 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/15/01, 11/8/04.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-15 have been examined and claims 1-15 have been rejected.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. The priority date is August 14, 2000.

Specification

3. The disclosure is objected to because of the following informalities:
Appropriate correction is required.
 - 3-1. It appears that "showing the results or a comparative example", as described in line 5 of page 10, should be "showing the results for a comparative example".
 - 3-2. It appears that "The data input circuit 11", as described in line 15 of page 11, should be "The data input section 11".
 - 3-3. It appears that "the rotary formed body 32", as described in lines 17-18 of page 13, should be "the rotary formed body 31".

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

All the independent claims recite the limitation, “analyses by a finite element method a forming process”. However, as shown in FIG. 5B and described at pages 15-16, every element of A is a zero in the expanded stiffness matrix $K\beta$. Therefore, without undue experimentation, it is unclear for one skilled in the art how to analyze by a finite element method a forming process with the expanded stiffness matrix $K\beta$.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7-1. Claim 1 recites the limitation “said rotary body” in line 7 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of claim examination, the Examiner will presume that “said rotary body” refers to “said rotary formed body”.

7-2. Claim 3 recites the limitation “said variables” in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim because only “a variable” has been recited in claim 1.

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7-3. Claim 4 recites the limitation “said rotary body” in lines 4, 6, and 7 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of claim examination, the Examiner will presume that “said rotary body” refers to “said rotary formed body”.

7-4. Claim 5 recites the limitation “said rotary body” in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim. For the purpose of claim examination, the Examiner will presume that “said rotary body” refers to “said rotary formed body”.

7-5. Claim 5 also recites the limitation “said elements” in line 6 of the claim. It is vague and indefinite regarding “said elements” because two different “elements” have been recited in line 2 of claim 1 and in line 4 of claim 5. For the purpose of claim examination, the Examiner will presume that “said elements” refer to the “elements” recited in line 4 of claim 5.

7-6. Claim 8 recites the limitation “said variables” in lines 3-4 of the claim. There is insufficient antecedent basis for this limitation in the claim because only “a variable” has been recited in claim 6.

7-7. Claim 10 recites the limitation “said elements” in line 5 of the claim. It is vague and indefinite regarding “said elements” because two different “elements” have been recited in line 4 of claim 6 and in line 3 of claim 10. For the purpose of claim examination, the Examiner will presume that “said elements” refer to the “elements” recited in line 3 of claim 10.

7-8. Claim 13 recites the limitation “said variables” in line 3 of the claim. There is insufficient antecedent basis for this limitation in the claim because only “a variable” has been recited in claim 1.

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7-9. Claim 15 recites the limitation "said elements" in line 5 of the claim. It is vague and indefinite regarding "said elements" because two different "elements" have been recited in line 3 of claim 11 and in line 3 of claim 15. For the purpose of claim examination, the Examiner will presume that "said elements" refer to the "elements" recited in line 3 of claim 15.

7-10. Claims not specifically rejected above are rejected as being dependent on a rejected claim.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-15 are rejected under 35 U.S.C. 101 because the inventions as disclosed in claims are directed to non-statutory subject matter.

9-1. Regarding claims 1-15, it is not tangibly embodied because it could be practiced with pencil and paper and because it appears to be directed to abstract ideas. Furthermore, claims 11-15 are directed to a program that is software per se.

9-2. The Examiner acknowledges that even though the claims are presently considered non-statutory they are additionally rejected below over the prior art. The Examiner assumes the Applicant will amend the claims to overcome the 101 rejections and thus make the claims statutory.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 3, 5-6, 8, 10-11, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et al., “Simulation of T-Section Profile Ring Rolling by the 3-D Rigid-Plastic Finite Element Method”, Int. J. Mech. Sci., Vol. 33, No. 7, 1991, page 541-547 and 549-550 (IDS reference AS).

11-1. Regarding claim 1, Yang et al. disclose a numerical-simulation method for rotary metal forming which:

divides into a plurality of finite elements (finite element method is used, Abstract, page 541) a predetermined model zone between two imaginary cutting planes intersecting with a circumferential direction in a rotary formed body rotated about an axis of rotation (only a ring segment spanning the rill gap is analysed in order to save computation time, Abstract, page 541);

expresses velocity boundary conditions of said imaginary cutting planes for said model zone by a function where angular velocity for rotation about said axis of rotation of said rotary body is made a variable (Equation (2), page 543); and

analyses by a finite element method a forming process which continuously produces plastic deformation by localized contact with said rotary formed body (simulate the open pass profile ring rolling, Abstract, page 541).

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11-2. Regarding claim 3, Yang et al. further disclose said velocity boundary conditions are expressed by a function having other variables capable of conversion into said variables (for example, in Equation (2), " $|V_s|/u_0$ " may be represented by a variable ψ which is capable of conversion into V_s with an associated coefficient).

11-3. Regarding claim 5, Yang et al. further disclose involving;

dividing a non-model zone outside of said model zone of said rotary body by elements for data storage, and of said two imaginary cutting planes, sequentially storing data related to said velocity boundary conditions output from one of said imaginary cutting planes in said elements and inputting from an other of said imaginary cutting planes (once the material has emerged from the exit side of the roll gap it undergoes rigid body motion with respect to the axis of the ring until it enters the roll gap in the next pass, paragraph 4, page 542), or

computing said data for said non-model zone using interpolation related to the angle about said axis of rotation, based on said data at said one of said imaginary cutting planes and said data at said other of said imaginary cutting planes, and

inputting from said other of said imaginary cutting planes.

11-4. Regarding claims 6, 8, and 10, these medium claims include equivalent method limitations as in claims 1, 3, and 5, and are anticipated using the same analysis of claims 1, 3, and 5.

11-5. Regarding claims 11, 13, and 15, these program claims include equivalent method limitations as in claims 1, 3, and 5, and are anticipated using the same analysis of claims 1, 3, and 5.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 4, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al., "Simulation of T-Section Profile Ring Rolling by the 3-D Rigid-Plastic Finite Element Method", Int. J. Mech. Sci., Vol. 33, No. 7, 1991, page 541-547 and 549-550 (IDS reference AS) in view of Davey et al., "An efficient solution method for finite element ring-rolling simulation", International Journal for Numerical Methods in Engineering, Volume 47, Issue 12, Abstract.

13-1. Regarding claim 4, Yang et al. fails to disclose applying Euler method and Lagrange method for rotary metal forming.

Davey et al. disclose a solution strategy to address the concern that the computational costs are extreme in the finite element ring-rolling simulation involving the combined use of an arbitrary Lagrangian-Eulerian formulation and a successive preconditioned conjugate gradient method. As suggested by Davey et al., their approach is shown to offer considerable computational savings.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Yang et al. to incorporate the teachings of Davey et al. to obtain the invention as specified in claim 4 because Davey's approach is shown to offer considerable computational savings.

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13-2. Regarding claim 9, the medium claim includes equivalent method limitations as in claim 4 and is unpatentable using the same analysis of claim 4.

13-3. Regarding claim 14, the program claim includes equivalent method limitations as in claim 4 and is unpatentable using the same analysis of claim 4.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Reference to Wayne et al., U.S. Patent 5,377,116 issued December 27, 1994, is cited as disclosing a method for designing a cutting tool using finite element models.

Reference to Wollmer et al., U.S. Patent 4,761,867 issued August 9, 1988, is cited as disclosing a method for producing ring gears.

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Jean R. Homere can be reached on (571) 272-3780. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day *H.D.*
February 6, 2005

Thayphan
Thai Phan
Patent Examiner
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